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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,509	04/28/2005	Duncan Alexander Robertson	MCI-7307	4045

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EXAMINER

LEACH, CRYSTAL I

ART UNIT	PAPER NUMBER
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3737

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/509,509

Applicant(s)

ROBERTSON ET AL.

Examiner

Crystal I. Leach

Art Unit

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>9/28/2004</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Examiner notes that claims 8, 16 and 18 invoke 35 U.S.C. 112, sixth paragraph.

Examiner notes that claims 19-24 have not been officially cancelled. Applicant must cancel claims and provide a marked up copy of the amended claims showing that claims 19-24 have been cancelled from examination.

Information Disclosure Statement

1. The Information Disclosure Statement (IDS) submitted on September 28, 2004, is in compliance with 37 CFR 1.97 and 1.98. The references therein have been considered.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "86" on figure 15 has been used to designate both the rotating plane mirror and quarter wave plate. The written description discloses that the quarter wave plate is represented by reference character "88" (see p. 16, lines 22-25). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required

corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Reference character "89" disclosed on p. 16, line 28 of the written description, is not displayed in figure 15. On p. 11, lines 11-12 of the written description, reference character "5" is not displayed on figure 4. Additionally, reference character "25" mentioned on p. 13, line 6, is not displayed on any of the provided figures. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to because it is unclear how reference character "III" on figure 1, represents the "scanning direction" as mentioned in the written description on p. 10, lines 27-32. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the

immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities:

On p. 5, line 17, --,-- needs to be inserted after "collector".

On p. 18, line 1, "46" needs to be removed.

Appropriate correction is required.

6. The following is a quotation of the sixth paragraph of 35 U.S.C. 112:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

Regarding claim 1, the word "means" is followed by functional language in which the claimed element, specifically, the "isolation means", recites a means for performing a specified function.. Examiner interprets claim 1 as intent to invoke 35 U.S.C. 112, sixth paragraph. However, since the "means for" functional language is modified by a sufficient structure, whereby the sufficient structure is a quasi-optical isolator, claim 1 fails to comply with the 3-prong analysis and does not invoke 35 U.S.C 112, sixth paragraph.

Regarding claims 1 and 9-12, the word "means" is followed by functional language in which the claimed elements of claims 1 and 9-12 recite a means for performing a specified function. Examiner interprets these claims as intent to invoke 35 U.S.C. 112, sixth paragraph. Although examiner interprets the scanning means of claims 1, 9 and 10 to be the mirror, applicant has failed to distinctly point out in the written description the sufficient structure, which represents the "scanning means". Likewise, applicant has failed to distinctly point out in the written description, the sufficient structure, which represents the "indexing means" of claims 11 and 12. Therefore, 35 U.S.C. 112, sixth paragraph has not been invoked for claims 1 and 9 -12.

Claim Objections

7. Claims 1, 4, 8 and 14 are objected to because of the following informalities:

On the third line of claim 1 and the third line of claim 14, "millimeter" needs to be changed to --millimeter--.

Applicant does not disclose the significance of using a "quasi-optical isolator" in the written description. Therefore, examiner notes that an isolator is sufficiently capable of performing the limitations specified in claim 1.

On the second line of claim 4, "Guassian" needs to be changed to --Gaussian--.

On the second line of claim 8, "focusing" needs to be changed to --focusing--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 13, the phrase "for example" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1-3, 8, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edrich (4,407,292) in view of Huguenin et al. (5,760,397).

Edrich teaches a non-contact passive medical scanning imager for imaging subcutaneous body temperature (Abstract, lines 1-3) comprising: a detector capable of sensing millimeter wave electromagnetic radiation (5); a collector capable of collecting radiation emitted from a patient and directing that radiation along a collection path to the detector in such a manner that the collected radiation has a defined sensitivity profile across and along substantially the entire length of that path (see "waveguide" and "receiving horn", col. 2, lines 49-55 and Abstract, lines 3-5); scanning means capable of causing a scan of a target area of the patient (col. 2, lines 51-52 and col. 2, line 68 – col. 3, line 4); a corrugated feedhorn (2); focusing means (col. 2, lines 16-25).

Edrich does not teach an isolator capable of preventing signal leakage from the detector being emitted towards the patient's body nor does Edrich teach a linearly polarized detector and an apparatus having polarization means for altering the polarization of received radiation so as to align with the polarization of the detector.

Huguenin et al. teach an isolator capable of preventing signal leakage from the detector being emitted towards the patient's body (184). Additionally, Huguenin et al. teach a linearly polarized detector and an apparatus having polarization means for altering the polarization of received radiation so as to align with the polarization of the detector (col. 5, lines 25-29 and 32-44; col. 7, lines 59-61 and col. 8, lines 5-7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include an isolator, linearly polarized detector and polarization means for

altering the polarization of received radiation so as to align with the polarization of the detector in the Edrich apparatus, in light of the teaching of Huguenin et al., in order to suppress unwanted reflections (see col. 6, line 67) and to account for the natural polarization effects of radiometric emissions.

12. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edrich (4,407,292) in view of Huguenin et al. (5,760,397) further in view of Woskov et al. (5,785,426).

The combined invention of Edrich in view of Huguenin et al. do not explicitly teach the collected radiation having a Gaussian sensitivity profile, wherein the feedhorn is capable of converting a fundamental Gaussian mode beam of radiation into a waveguide mode in which radiation propagates through a waveguide to the detector.

Woskov et al. teach the collected radiation having a Gaussian sensitivity profile, wherein the feedhorn is capable of converting a fundamental Gaussian mode beam of radiation into a waveguide mode in which radiation propagates through a waveguide to the detector (col. 3, lines 8-10 and col. 6, lines 7-24 and 28-35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include a collector capable of collecting radiation having a Gaussian sensitivity profile and a feedhorn capable of converting a fundamental Gaussian mode beam of radiation into a waveguide mode in which radiation propagates through a waveguide to the detector in the combined apparatus of Edrich in view of Huguenin et al., in light of the teachings of Woskov et al., in order to enhance wave propagation and improve spatial resolution.

13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Edrich (4,407,292) in view of Huguenin et al. (5,760,397) further in view of Durnin et al. (4,852,973).

The combined invention of Edrich in view of Huguenin et al. do not explicitly teach a collector capable of collecting radiation that has a Bessel sensitivity profile.

Durnin et al. teaches collecting radiation that has a Bessel sensitivity profile (Abstract, lines 1-7 and 20-26).

It would have been obvious to one having ordinary skill in the art at the time of the invention to include a collector capable of collecting radiation that has a Bessel sensitivity profile in the combined apparatus of Edrich in view of Huguenin et al., in light of the teachings of Durnin et al., in order to improve the apparatus's ability of reducing wave beam diffraction.

14. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Edrich (4,407,292) in view of Huguenin et al. (5,760,397) further in view of Durnin et al. (4,852,973) and further in view of Brenden et al. (4,545,653).

The combined invention of Edrich in view of Huguenin et al. further in view of Durnin et al. do not teach an axicon.

Brenden et al. teach an axicon (col. 1, line 66 – col. 2, line 21; col. 2, lines 35-44; and col. 3, lines 37-48).

It would have been obvious to one having ordinary skill in the art at the time of the invention to include an axicon in the combined invention of Edrich in view of

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Huguenin et al. further in view of Durnin et al., in light of the teachings of Brenden et al., in order to improve focusing of beam energy (col. 3, lines 5-14).

15. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edrich (4,407,292) in view of Huguenin et al. (5,760,397) further in view of Mushiake et al. (6,469,820).

The combined invention of Edrich in view of Huguenin et al. teach an apparatus capable of repeatedly sweeping (see Edrich, col. 2, line 68 – col. 3, line 5) and moving the collection path in a direction perpendicular to the scanning direction (see Edrich, col. 2, line 63 – col. 3, line 5 and figure 1) thereby moving the deflector (see Edrich, “reflector”, col. 3, lines 1-4) linearly along said axis.

Edrich in view of Huguenin et al. do not teach an apparatus capable of sweeping the collection path through 360°, a deflector that is rotatable about one axis to scan the collection path in a scanning direction across a body, means for swinging the deflector about a second axis perpendicular to the first axis.

Mushiake et al. teach an apparatus capable of sweeping the collection path through 360° (col. 5, lines 24-28), a deflector that is capable of being rotated about one axis to scan the collection path in a scanning direction across a body (col. 10, lines 36-40), means for swinging the deflector about a second axis perpendicular to the first axis (col. 5, lines 16-19).

16. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Edrich (4,407,292) in view of Huguenin et al. (5,760,397).

Edrich teaches a frequency range of 8 to 36 GHz (col. 2, line 50).

Huguenin et al. teach the range of 30 to 300 GHz (col. 1, lines 17-25). The ranges taught by both Edrich and Huguenin et al. are capable of providing thermal radiation information from subcutaneous tissue.

However, neither Edrich nor Huguenin et al. teach the range of 10 to 200 GHz.

It would have been obvious to one of ordinary skill in the art at the time of the invention to select values from the overlapping frequency ranges (see MPEP 2144.05) that will yield the most desirable results for a given procedure as decided by a physician or operator.

17. Claim 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edrich (4,407,292) in view of Huguenin et al. (5,760,397) further in view of Woskov et al. (5,785,426).

The combined invention of Edrich in view of Huguenin et al. do not explicitly teach an apparatus having calibration loads capable of emitting millimeter wave radiation at a pre-determined intensity, wherein the imager is capable of directing the radiation to the detector to enable the imager to be calibrated and the calibration loads both having means for maintaining them at different temperatures and are provided in the scanning path of the imager, so that the imager can be calibrated for each pass of the collector.

Woskov et al. teach an apparatus having calibration loads capable of emitting millimeter wave radiation at a pre-determined intensity, wherein the imager is capable of directing the radiation to the detector to enable the imager to be calibrated and the calibration loads both having means for maintaining them at different temperatures and

are provided in the scanning path of the imager, so that the imager can be calibrated for each pass of the collector (col. 11, line 49 – col. 12, line 28).

It would have been obvious to one having ordinary skill in the art at the time of the invention to include the calibration loads taught by Woskov et al. in the combined invention of Edrich in view of Huguenin et al. in order to ensure proper calibration of the apparatus thereby improving diagnosis. It also would have been obvious to one having ordinary skill in the art at the time of the invention to select temperatures straddling the range of the intended surface to be imaged and examined.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fischer et al. (4,366,381) teach an electrothermographic apparatus for detection of malignancies in human bodies; Bridges ('257) teaches breast cancer detection, imaging and screening by electromagnetic millimeter waves and ('437) a microwave method and system to detect and locate cancers in heterogeneous tissues; Carr ('716) teaches a microwave detection system, ('961) a multiple antennae breast screening system, ('272) a microwave endoscope detection and treatment system, and ('124) microwave detection of tumors, particularly breast tumors; Chive Maurice et al. (5,176,146) teach a method for the measurement of temperatures by microwave radiometry, with automatic calibration of the measurement, and device for operating this method; Klingenberg et al. ('209) teach a method and apparatus for non-

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contacting identification of the temperature distribution in an examination subject and ('627) a method and apparatus for identifying the distribution of the dielectric constants in an object; Gopalsami et al. (5,020,920) teach a method and apparatus for millimeter-wave detection of thermal waves for materials evaluation; Sterzer et al. (5,688,050) teach a temperature-measuring microwave radiometer apparatus; Raab et al. (4,864,308) teach a frequency-scanning radiometer; Petrosian (5,900,837) teaches a method and apparatus for compensation of diffraction divergence of beam of an antenna system; Lo et al. (6,052,024) teach a monolithic, low-noise, synchronous direct detection receiver for passive microwave/millimeter-wave radiometric imaging systems; Robert et al. (3,622,888) teach microwave radiometers; Sepponen (4,641,659) teaches a medical diagnostic microwave scanning apparatus.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Crystal I. Leach whose telephone number is 571-272-5211. The examiner can normally be reached on Monday through Friday, 8 am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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